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[[31.]] 32. (Currently Amended) The method of claim ~~30~~ 31 wherein the flowing step includes the step of flowing the fuel/air mixture into a single stage combustion chamber.

[[32.]] 33. (Currently Amended) The method of claim ~~30~~ 31 wherein the premixer includes a mixing tube having an axis, and wherein the flowing step includes the step of deflecting the fuel/air mixture away from the axis.

### **AMENDMENTS TO THE DRAWINGS**

Applicant proposes changing Figs. 1-15 to add the term "PRIOR ART" in accordance with the Examiner's requirement (Detailed Office Action at ¶ 3). Attached are copies of Figs. 1-15 with the term "PRIOR ART" shown in red.

### **REMARKS**

Claims 1, 3-6, 9, 11-14, 20-22, 24-33 are presently at issue in this case, with claims 2, 7, 8, and 15-19<sup>1</sup> having been withdrawn, and claims 10 and 23 cancelled herein without prejudice to the consideration of the subject matter as part of the invention defined by the remaining claims, for reasons that will become apparent from the discussion below.

Initially, the Examiner's statements (Detailed Office Action, ¶ 2) regarding Applicant's IDS are noted. Regarding the Japanese 06241455 "Abstract" (IDS, p. 6) and Japanese Laid Open No. 57-41524 "Partial Translation" (IDS, p. 5) references, Applicant had submitted these English-language documents which, in conjunction with

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<sup>1</sup> The Office Action also refers to a claim "87" being withdrawn. (Summary at ¶ 4a). Clarification is requested.

the drawings, constitute reasonably accurate "statements" of the significance of the respective references to allow consideration by the Examiner. Applicant respectfully requests that the Examiner consider the respective English language documents and acknowledge such.

Regarding the Treager and "Fuel Injector Cuts NOx" references (IDS, p. 6), Applicant believes that copies of these English-language references were, in fact, provided during prosecution of parent application Serial No. 09/500,960. However, to allow timely consideration, Applicant is submitting additional copies and respectfully requests consideration and acknowledgement by the Examiner.

For the convenience of the Examiner, a new PTO 1449 Form has been included listing the items discussed above.

Also, Applicant has amended Figs. 1-15 of the drawings to comply with the Examiner's requirement (Detailed Office Action, ¶ 3).

Further, Applicant acknowledges the inadvertent error in misnumbering the claims added June 17, 2003. The affected claims have been renumbered 28-33 as required by the Examiner (Detailed Office Action, ¶ 4).

Still further, claim 11 has been amended *inter alia* to cure the "lack of proper antecedent basis" objection (Detailed Office Action, ¶ 5). Applicant maintains, however, that one skilled in the art reading unamended claim 11 would have understood what was being claimed such that no indefiniteness in fact existed.

### **Claims 11 And 12**

On the merits, claim 11 is directed to embodiments of the disclosed invention where *inter alia* fuel valves and air valves control the flow of the fuel and compressed air

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entering the premixer to provide a controlled fuel/air ratio for the mixture provided to the combustor through the premixer exit. Separate and apart from the fuel valve and the air valve, claim 11 requires relatively movable inner and outer members defining the premixer exit flow area for controlling the velocity of the discharged fuel/air mixture. The possible benefits for exit velocity control include one or more of enhanced predictable combustion performance over the entire load range, greater margin to flashback and premixer pulsations for decreased flow area at low power, and better utilization of combustor volume due to increased residence time for increased flow area (decreased velocity) at high power, as were pointed out in the specification e.g. at p. 67.

Claim 11 has been amended only to place it in independent form and to overcome the Examiner's rejection. No change in claim scope has occurred.

On the merits, claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) over Rubins et al., further in view of Ohyama and optionally Komatsu et al. The Examiner asserts that it would be obvious to use both the fuel and air inlet valves (shown by Ohyama) and the mixture exit valves (shown by Rubins et al., Holzapfel, Owens, and Komatsu et al.) to control the amount of fuel and air entering the combustor. Applicant respectfully traverses the Examiner's rejection at ¶ 18 of Detailed Office Action.

In each of Rubins et al., Holzapfel, Owens, and Komatsu et al. the mixture exit valve controls the fuel/air ratio, and thus the mixture amount (i.e., lbm/sec) entering the combustor. One of ordinary skill would not have further modified any of these devices to add the additional fuel and air valves (taught by Ohyama) upstream of the premixer to achieve fuel/air ratio control as this function is already carried out by the exit mixture valves of the first-cited references. That is, one skilled in the art would have to omit the

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fuel/air control function of the exit mixture valves which is an important feature of the devices disclosed in these references. Absent applicant's own teaching, the Examiner has identified no motivation to combine the references cited to achieve the apparatus defined by claim 11, which combinations would entail at least significant and unspecified alterations to the disclosed structures to ensure upstream fuel/air ratio control, let alone a firm expectation of success. Consequently, the apparatus defined by amended claim 11 is non-obvious and patentable over the cited art.

Claim 12 requires a controller to control actuators for both the air valve and the movable (mixture valve) member. The art cited by the Examiner does not show or suggest this, nor does it suggest an upstream (of the premixer) inlet air valve and a separate, downstream exit (mixture valve) member, as discussed above. Hence, claim 11 is non-obvious and patentable for at least these reasons.

#### **Claims 24-27**

Claim 24 is directed to apparatus having *inter alia* substantially the same key elements discussed above in relation to claim 11. Claim 24 has been amended to read independently and to further specify that the air valve and fuel valve components that control fuel/air ratio are "separate from the mixture valve."

On the merits, claim 24 stands rejected apparently<sup>2</sup> over Owens, Leonard et al., Powter et al., Komatsu et al., Rubins et al., Holzapfel, further in view of Willis et al., Blaha '108, or Blaha '300. Applicant again respectfully traverses the Examiner's rejections of claim 24 as recited at paras. 15 and 16.

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<sup>2</sup> No positive identification of the specific primary references was given due, perhaps, to the absence of an intended explanatory footnote for the phrase "above prior art<sup>1</sup>" in ¶ 15, line 2.

None of Willis, Blaha, '108, or Blaha '300 teach a controllable premixer exit mixture valve or an air valve and fuel valve for controlling the fuel/air ratio to the premixer inlet. Owens, Rubins et al., Holzapfel, and Komatsu et al. disclose exit mixture valves, but not inlet air and fuel valves for controlling fuel/air ratio of the mixture. Also, neither Leonard et al. nor Powter et al. teach inlet air and fuel valves for fuel/air ratio control. Hence, no *prima facie* case of obviousness of claim 24 exists, and claim 24 is therefore patentable.

Claims 25-27 are patentable at least for the reasons given above as a consequence of their dependence (as amended) on claim 24. Moreover claim 26, as amended, is directed to a particular embodiment where "only" a single premixer is used, and the air valve is located 180° from the premixer. The advantages of this construction in terms of more favorable engine cooling air flow utilization and distribution are set forth in detail at pp. 83-85 of the specification. None of the prior art including Mowill '363 discloses or suggests this construction. Therefore, claim 26 is non-obvious and patentable for at least this additional reason.<sup>3</sup>

**Claims 1, 3-6, 9; Claims 13, 14; Claims 20-22; Claims 28-30; and Claims 31-33**

To expedite prosecution, Applicant has amended each of independent claims 1, 13, 20, 28, and 31 to recite *inter alia* either structure, or a method step requiring a fuel valve and an air valve to control the fuel/air ratio of the fuel and air received by the premixer inlet in addition to a premixer exit mixture valve that controls the mixture exit

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<sup>3</sup> Applicant reserves the right to timely present and prosecute claims broader in scope directed to this embodiment.

velocity into the combustor. As discussed in relation to claims 11 and 24, *supra*, the cited art does not teach or suggest this combination. Consequently, these claims are non-obvious and patentable for the reasons given above.

Also, Applicant reserves the right to add back into this application, one or more of the withdrawn claims, should any of the generic claims be allowed.

Wherefore, Applicant requests reexamination and/or reconsideration of claims 1, 3-6, 9, 11-14, 20-22, and 24-33, as amended. Being filed together herewith is a Petition for Extension of Time (3 mos.) and a check for \$950.00. If any fees or extensions of time not requested separately are necessary, Applicant hereby petitions for same and authorizes the necessary fees to be charged to Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: February 18, 2004

By: 

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**Attachments:** 22 Annotated Sheets (Figs. 1-15 ) showing proposed changes  
PTO Form 1449  
Copy of Japanese 06241455 "Abstract"  
Copy of Japanese Laid Open No. 57-41524 "Partial Translation"  
Copy of Teague, Erwin E., "Aircraft Gas Turbine Technology"  
Copy of "Fuel Injector Cuts NOx"

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